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Hem P. Takiar

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EXAMINER

MALDONADO, JULIO J

ART UNIT

PAPER NUMBER

2823

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Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/602,373

Applicant(s)

TAKIAR, HEM P.

Examiner

Julio J. Maldonado

Art Unit

2823

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 08 August 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-18,20,21 and 27-57 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-18,20,21 and 27-57 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_.

**DETAILED ACTION**

***Allowable Subject Matter***

1. The indicated allowability of claims 1-18, 20, 21 and 27-57 is withdrawn in view of the newly discovered reference(s) to Cole et al. (U.S. 6,705,925 B1). Rejections based on the newly cited reference(s) follow.

***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-10, 12, 15 and 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bolken et al. (U.S. 2004/0229401 A1) in view of Cole et al. (U.S. 6,705,925 B1).

In reference to claim 1, Bolken et al. (Figs.2A-2F and Fig.5) teach a method for concurrently forming a plurality of integrated circuit products, said method comprising providing a multi-instance substrate (12) having a plurality of instances; attaching one or more dies (14) to each of the instances on at least one side of the multi-instance substrate (12); electrically connecting each of the one or more dies (14) to the respective instance of the substrate (12); thereafter encapsulating together the plurality of instances on the at least one side of the multi-instance substrate (12) with a molding compound (18, 20); and subsequently singulating each of the plurality of instances using at least non-linear shaping of at least one region of each of the plurality of

instances, thereby forming the integrated circuit products, wherein said singulating is performed using techniques such as sawing, shearing or punching. Furthermore, Bolken et al. further teach attaching prior to encapsulating, one or more passive components to each of the instances (Bolken et al., [0052] – [0072]).

Bolken et al. fail to teach wherein the non-linear shaping of each of the instances by said singulating is achieved through curvilinear or non-rectangular cutting during said singulating. However, Cole et al. (Fig.2) teach a method of overcoming problems associated with conventional dicing processes such as sawing used in processes to singulate a substrate using non-linear shaping, wherein the non-linear shaping of each of the instances by said singulating is achieved through curvilinear or non-rectangular cutting during said singulating and wherein the substrate is composed of a material, such as various compositions of polymers, ceramics, glass (e.g., borosilicate glass, and other low-coefficient of thermal expansion glass), pure or doped silicon, germanium, gallium arsenide, or other semiconductor compounds of III-V elements or II-VI elements (Cole et al., column 1, line 25 – column 3, line 15). It would have been within the scope of one of ordinary skill in the art to combine the teachings of Bolken et al. and Cole et al. to enable the singulating step of Bolken et al. to be performed according to the teachings of Cole et al. because one of ordinary skill in the art at the time the invention was made would have been motivated to look to alternative suitable methods of performing the disclosed singulating step of Bolken et al. and art recognized suitability for an intended purpose has been recognized to be motivation to combine (MPEP

2144.07), and furthermore because it would result in a low cost process to cut irregularly-shaped dies from a substrate (Cole et al., column 2, lines 7 – 14).

In reference to claims 2 and 12, the combined teachings of Bolken et al. and Cole et al. teach wherein said electrically connecting includes at least wire bonding each of the one or more dies to the respective instance of the leadframe or wafer prior to said encapsulating (Bolken et al., [0055] – [0057]).

In reference to claims 3 and 15, the combined teachings of Bolken et al. and Cole et al. teach wherein said encapsulating forms a molded panel; and wherein said singulating of each of the instances cuts the molded panel into a plurality of molded packages which are the integrated circuit products (Bolken et al., Fig.2E).

In reference to claim 4, the combined teachings of Bolken et al. and Cole et al. teach as a non-preferred embodiment of the invention, to singulate said substrate using a laser beam provided by a laser (Cole et al., column 1, lines 57 – 59). Although not taught as a preferred embodiment, the combined teachings of Bolken et al. and Cole et al. teach this embodiment nonetheless, and disclosed examples and preferred embodiments do not constitute a teaching away from a broader disclosure or nonpreferred embodiments. In re Susi, 169 USPQ 423 (CCPA 1971). "A known or obvious composition does not become patentable simply because it has been described as somewhat inferior to some other product for the same use." In re Gurley, 31 USPQ2d 1130, 1132 (Fed. Cir. 1994). A reference may be relied upon for all that it would have reasonably suggested to one having ordinary skill in the art, including nonpreferred embodiments. Merck & Co. v. Biocraft Laboratories, 874 F.2d 804, 10

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USPQ2d 1843 (Fed. Cir.), cert. denied, 493 U.S. 975 (1989). Even a teaching away from a claimed invention does not render the invention patentable. See *Celeritas Technologies Ltd. v. Rockwell International Corp.*, 150 F.3d 1354, 1361, 47 USPQ2d 1516, 1522-23 (Fed. Cir. 1998), where the court held that the prior art anticipated the claims even though it taught away from the claimed invention. "The fact that a modem with a single carrier data signal is shown to be less than optimal does not vitiate the fact that it is disclosed." To further clarify, a prior art opinion that a claimed invention is not preferred for a particular limited purpose, does not preclude utility of the invention for that or another purpose, or even preferability of the invention for another purpose.

In reference to claim 5, the combined teachings of Bolken et al. and Cole et al. teach wherein said singulating is performed by a high-pressure water jet (Cole et al., column 3, lines 10 – 60).

In reference to claim 6, the combined teachings of Bolken et al. and Cole et al. teach wherein the water jet includes at least water and an abrasive material (Cole et al., column 3, lines 10 – 60).

In reference to claim 7, the combined teachings of Bolken et al. and Cole et al. teach wherein the substrate is a printed circuit board (Bolken et al., Fig.5).

In reference to claim 8, the combined teachings of Bolken et al. and Cole et al. teach wherein the passive components include at least one of a resistor and a capacitor (Bolken et al., [0037]).

In reference to claim 9, the combined teachings of Bolken et al. and Cole et al. teach wherein the one or more dies are semiconductor dies (Bolken et al., [0037]).

In reference to claims 10 and 16, the combined teachings of Bolken et al. and Cole et al. inherently teach wherein the integrated circuit products are memory cards (Bolken et al., [0037]).

4. Claims 11, 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bolken et al. (U.S. 2004/0229401 A1) in view of Cole et al. (U.S. 6,705,925 B1) as applied to claims 1-10, 12, 15 and 16 above, and further in view of Bolken (U.S. 6,444,501 B1).

The combined teachings of Bolken et al. and Cole et al. substantially teach all aspects of the invention but fail to teach wherein the integrated circuit products are peripheral memory cards and further teaching applying a mark to the molding compound for each of the plurality of instances, wherein the mark is a printed mark. However, Bolken in a method of forming peripheral memory cards (Figs.1 and 5) teaches providing an area (40) on its molding compound with a printed mark for labeling purposes (column 5, lines 31 – 41), and wherein the memory card is molded so that its product is a non-rectangular memory card (column 6, lines 41 – 54).

Therefore, it would be obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Bolken et al. and Cole et al. with Bolken to enable forming a printed mark in the combination of Bolken et al. and Cole et al. as taught by Bolken. It would also have been obvious to one of ordinary skill in the art at the time the invention was made to configure the memory card of Bolken et al. and Cole et al. as taught by Bolken for the further advantage of identifying the end of

the semiconductor card having external contacts and to ensure that a user inserts the card in a proper orientation (column 6, lines 41 – 54).

5. Claims 17, 21 and 55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bolken et al. (U.S. 2004/0229401 A1) in view of Cole et al. (U.S. 6,705,925 B1) and Featherby et al. (U.S. 6,368,899 B1).

Bolken et al. (Figs.2A-2F and Fig.5) teach a method for concurrently forming a plurality of integrated circuit products, said method comprising providing a multi-instance substrate (12) having a plurality of instances; attaching one or more dies (14) to each of the instances on at least one side of the multi-instance substrate (12); electrically connecting each of the one or more dies (14) to the respective instance of the substrate (12); thereafter encapsulating together the plurality of instances on the at least one side of the multi-instance substrate (12) with a molding compound (18, 20); and subsequently singulating each of the plurality of instances using at least non-linear shaping of at least one region of each of the plurality of instances, thereby forming the integrated circuit products, wherein said singulating is performed using techniques such as sawing, shearing or punching. Furthermore, Bolken et al. further teach attaching prior to encapsulating, one or more passive components to each of the instances (Bolken et al., [0052] – [0072]).

Bolken et al. fail to teach wherein the non-linear shaping of each of the instances by said singulating is achieved through curvilinear or non-rectangular cutting during said singulating. However, Cole et al. (Fig.2) teach a method of overcoming problems associates with conventional dicing processes such as sawing used in processes to



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singulate a substrate using non-linear shaping, wherein the non-linear shaping of each of the instances by said singulating is achieved through curvilinear or non-rectangular cutting during said singulating and wherein the substrate is composed of a material, such as various compositions of polymers, ceramics, glass (e.g., borosilicate glass, and other low-coefficient of thermal expansion glass), pure or doped silicon, germanium, gallium arsenide, or other semiconductor compounds of III-V elements or II-VI elements (Cole et al., column 1, line 25 – column 3, line 15). It would have been within the scope of one of ordinary skill in the art to combine the teachings of Bolken et al. and Cole et al. to enable the singulating step of Bolken et al. to be performed according to the teachings of Cole et al. because one of ordinary skill in the art at the time the invention was made would have been motivated to look to alternative suitable methods of performing the disclosed singulating step of Bolken et al. and art recognized suitability for an intended purpose has been recognized to be motivation to combine (MPEP 2144.07), and furthermore because it would result in a low cost process to cut irregularly-shaped dies from a substrate (Cole et al., column 2, lines 7 – 14).

The combined teachings of Bolken et al. and Cole et al. substantially teach all aspects of the invention but fail to disclose applying a coating to each of the instances after said singulating. However, Featherby et al. (Figs. 1A, 7 and 8) teach a method of forming semiconductor packages (12, 16) including applying providing said semiconductor package (12, 16); and applying a coating (300, 400) to said package (12, 16) (Featherby et al., column 11, line 38 – column 12, line 29). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to

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combine the teachings of Bolken et al. and Cole et al. with Featherby et al. to enable applying a coating on the completed packages of Bolken et al. and Cole et al. as taught by Featherby et al., for the further advantage of protecting the package against moisture or other contaminants (Featherby et al., column 10, lines 38 – 45).

6. Claims 18 and 56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bolken et al. (U.S. 2004/0229401 A1) in view of Cole et al. (U.S. 6,705,925 B1) and Cho (U.S. 6,235,555 B1).

Bolken et al. (Figs.2A-2F and Fig.5) teach a method for concurrently forming a plurality of integrated circuit products, said method comprising providing a multi-instance substrate (12) having a plurality of instances; attaching one or more dies (14) to each of the instances on at least one side of the multi-instance substrate (12); electrically connecting each of the one or more dies (14) to the respective instance of the substrate (12); thereafter encapsulating together the plurality of instances on the at least one side of the multi-instance substrate (12) with a molding compound (18, 20); and subsequently singulating each of the plurality of instances using at least non-linear shaping of at least one region of each of the plurality of instances, thereby forming the integrated circuit products, wherein said singulating is performed using techniques such as sawing, shearing or punching. Furthermore, Bolken et al. further teach attaching prior to encapsulating, one or more passive components to each of the instances (Bolken et al., [0052] – [0072]).

Bolken et al. fail to teach wherein the non-linear shaping of each of the instances by said singulating is achieved through curvilinear or non-rectangular cutting during said

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singulating. However, Cole et al. (Fig.2) teach a method of overcoming problems associated with conventional dicing processes such as sawing used in processes to singulate a substrate using non-linear shaping, wherein the non-linear shaping of each of the instances by said singulating is achieved through curvilinear or non-rectangular cutting during said singulating and wherein the substrate is composed of a material, such as various compositions of polymers, ceramics, glass (e.g., borosilicate glass, and other low-coefficient of thermal expansion glass), pure or doped silicon, germanium, gallium arsenide, or other semiconductor compounds of III-V elements or II-VI elements (Cole et al., column 1, line 25 – column 3, line 15). It would have been within the scope of one of ordinary skill in the art to combine the teachings of Bolken et al. and Cole et al. to enable the singulating step of Bolken et al. to be performed according to the teachings of Cole et al. because one of ordinary skill in the art at the time the invention was made would have been motivated to look to alternative suitable methods of performing the disclosed singulating step of Bolken et al. and art recognized suitability for an intended purpose has been recognized to be motivation to combine (MPEP 2144.07), and furthermore because it would result in a low cost process to cut irregularly-shaped dies from a substrate (Cole et al., column 2, lines 7 – 14).

The combined teachings of Bolken et al. and Cole substantially teach all aspects of the invention but fail to disclose affixing an outer casing or package to each of the instances after said singulating. However, Cho (Fig.1) teaches a conventional application of packaged integrated semiconductor circuits, which include affixing an outer casing or package to each of the semiconductor circuits (Cho, column 1, lines 1 –

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55). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Bolken et al. and Cole et al. with Cho to enable affixing the circuit of Bolken et al. and Cole et al. as taught by Cho to arrive at the claimed invention.

7. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bolken et al. (U.S. 2004/0229401 A1) in view of Cole et al. (U.S. 6,705,925 B1) as applied to claims 1-10, 12, 15 and 16 above, and further in view of Joshi et al. (U.S. 2004/0018667 A1).

The combined teachings of Bolken et al. and Cole et al. substantially teach all aspects of the invention but fail to further teach electrically testing the instances after said encapsulating and before said singulating. However, Joshi et al. teach a method of forming semiconductor packages including an optional step of electrically testing the instances after said encapsulating and before said singulating (Joshi et al., [0008])). Furthermore, Mostafazadeh to U.S. 6,468,832 B1 teaches testing encapsulated dies before singulation may allow testing in panel form, which may be easier than testing after singulation (column 3, line 50 – column 4, line 14). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Bolken et al. and Cole et al. with Joshi et al. to enable electrically testing the instances of Bolken et al. and Cole et al. as taught by Joshi et al. to arrive at the claimed invention.

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8. Claims 27, 29-31, 33-40, 42-47, 49-51 and 53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bolken et al. (U.S. 2004/0229401 A1) in view of Cole et al. (U.S. 6,705,925 B1) and Bayan et al. (U.S. 6,399,415 B1).

In reference to claims 27, 29, 38, 40, 42-44 and 51, Bolken et al. (Figs.2A-2F and Fig.5) teach a method for concurrently forming a plurality of integrated circuit products, said method comprising providing a multi-instance leadframe or substrate (12) having a plurality of instances; attaching one or more dies (14) to each of the instances on at least one side of the multi-instance substrate (12); electrically connecting each of the one or more dies (14) to the respective instance of the substrate (12); thereafter encapsulating together the plurality of instances on the at least one side of the multi-instance substrate (12) with a molding compound (18, 20); and subsequently singulating each of the plurality of instances using at least non-linear shaping of at least one region of each of the plurality of instances, thereby forming the integrated circuit products, wherein said singulating is performed using techniques such as sawing, shearing or punching. Furthermore, Bolken et al. further teach attaching prior to encapsulating, one or more passive components to each of the instances (Bolken et al., [0052] – [0072]), wherein one of said passive components is labeled memory die, and another of said passive component is labeled controller die, and wherein said passive components can be placed on the substrate or leadframe one on top of the other (see Fig.6).

Bolken et al. fail to teach wherein the non-linear shaping of each of the instances by said singulating is achieved through curvilinear or non-rectangular cutting during said singulating. However, Cole et al. (Fig.2) teach a method of overcoming problems.

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associates with conventional dicing processes such as sawing used in processes to singulate a substrate using non-linear shaping, wherein the non-linear shaping of each of the instances by said singulating is achieved through curvilinear or non-rectangular cutting during said singulating and wherein the substrate is composed of a material, such as various compositions of polymers, ceramics, glass (e.g., borosilicate glass, and other low-coefficient of thermal expansion glass), pure or doped silicon, germanium, gallium arsenide, or other semiconductor compounds of III-V elements or II-VI elements (Cole et al., column 1, line 25 – column 3, line 15). It would have been within the scope of one of ordinary skill in the art to combine the teachings of Bolken et al. and Cole et al. to enable the singulating step of Bolken et al. to be performed according to the teachings of Cole et al. because one of ordinary skill in the art at the time the invention was made would have been motivated to look to alternative suitable methods of performing the disclosed singulating step of Bolken et al. and art recognized suitability for an intended purpose has been recognized to be motivation to combine (MPEP 2144.07), and furthermore because it would result in a low cost process to cut irregularly-shaped dies from a substrate (Cole et al., column 2, lines 7 – 14).

The combined teachings of Bolken et al. and Cole et al. fail to teach affixing the multi-instance or substrate on a removable tape. However, Bayan et al. (Figs.3A-6F) teach a method of forming electronic packages including providing a substrate (200); and affixing said substrate (200) to a removable tape (not shown) (Bayan et al., column 5, line 62 – column 6, line 8). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Bolken et

al. and Cole et al. with Bayan et al. to enable affixing the substrate of Bolken et al. and Cole to a removable tape as taught by Bayan et al. for the further advantage of supporting contacts during wire bonding (connecting) operations (Bayan et al., column 5, line 62 – column 6, line 8).

In reference to claim 30, the combined teachings of Bolken et al., Cole et al. and Bayan et al. teach removing the removable tape after said encapsulating and before said singulating (Bayan et al., column 5, line 62 – column 6, line 8).

In reference to claims 31 and 45, the combined teachings of Bolken et al., Cole et al. and Bayan et al. teach wherein each of the instances include exposed electrical contacts as part of the leadframe of the respective instance (Bolken et al., [0052] – [0072]).

In reference to claims 33 and 46, the combined teachings of Bolken et al., Cole et al. and Bayan et al. teach wherein said electrically connecting includes at least wire bonding each of the memory die and the controller die to the respective instances of the substrate or leadframe (Bolken et al., Fig.6).

In reference to claims 34 and 47, the combined teachings of Bolken et al. and Cole et al. and Bayan et al., teach as a non-preferred embodiment of the invention, to singulate said substrate using a laser beam provided by a laser (Cole et al., column 1, lines 57 – 59). Although not taught as a preferred embodiment, the combined teachings of Bolken et al. and Cole et al. teach this embodiment nonetheless, and disclosed examples and preferred embodiments do not constitute a teaching away from a broader disclosure or nonpreferred embodiments. In re Susi, 169 USPQ 423 (CCPA 1971). "A

known or obvious composition does not become patentable simply because it has been described as somewhat inferior to some other product for the same use." In re Gurley, 31 USPQ2d 1130, 1132 (Fed. Cir. 1994). A reference may be relied upon for all that it would have reasonably suggested to one having ordinary skill the art, including nonpreferred embodiments. Merck & Co. v. Biocraft Laboratories, 874 F.2d 804, 10 USPQ2d 1843 (Fed. Cir.), cert. denied, 493 U.S. 975 (1989). Even a teaching away from a claimed invention does not render the invention patentable. See Celeritas Technologies Ltd. v. Rockwell International Corp., 150 F.3d 1354, 1361, 47 USPQ2d 1516, 1522-23 (Fed. Cir. 1998), where the court held that the prior art anticipated the claims even though it taught away from the claimed invention. "The fact that a modem with a single carrier data signal is shown to be less than optimal does not vitiate the fact that it is disclosed." To further clarify, a prior art opinion that a claimed invention is not preferred for a particular limited purpose, does not preclude utility of the invention for that or another purpose, or even preferability of the invention for another purpose.

In reference to claims 35 and 49, the combined teachings of Bolken et al., Cole et al. and Bayan et al. teach wherein said singulating is performed by a high-pressure water jet (Cole et al., column 3, lines 10 – 60).

In reference to claims 36 and 50, the combined teachings of Bolken et al., Cole et al. and Bayan et al. teach wherein the water jet includes at least water and an abrasive material (Cole et al., column 3, lines 10 – 60).



In reference to claims 37, the combined teachings of Bolken et al., Cole et al. and Bayan et al. teach wherein said encapsulating can form a molded panel having a housing provided by the molding compound (Bolken et al., Fig.2E).

In reference to claims 39 and 53, the combined teachings of Bolken et al., Cole et al. and Bayan et al. teach wherein said encapsulating encapsulates both dies (Bolken et al., Fig.6).

9. Claims 28 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bolken et al. (U.S. 2004/0229401 A1) in view of Cole et al. (U.S. 6,705,925 B1) and Bayan et al. (U.S. 6,399,415 B1) as applied to claims 27, 29-31, 33-40, 42-47, 49-51 and 53 above, and further in view of Kim et al. (U.S. 6,489,218 B1).

The combined teachings of Bolken et al., Cole et al. and Bayan et al. teach forming electrical contacts on the leadframe or substrate after said removing of the removable tape and before said singulating (Bolken et al., [0056] – [0057]), but fail to teach wherein the removable tape is a polymer type and wherein the contacts are plated. However, Kim et al. teach a method of forming packages including providing a substrate or leadframe; affixing said substrate or leadframe on a polymer, removable tape; and forming electrical contacts on a leadframe or substrate after removing of the removable tape and before singulating said substrate or leadframe (column 4, lines 7 – 30 and column 5, lines 1 – 10). It would have been within the scope of one of ordinary skill in the art to combine the teachings of Bolken et al., Cole et al. and Bayan et al. with Kim et al. to enable using plating to form the contacts and using a polymer removable tape in Bolken et al., Cole et al. and Bayan et al. according to the teachings of Kim et al.

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because one of ordinary skill in the art at the time the invention was made would have been motivated to look to alternative suitable methods of forming the disclosed contacts and removable tape of Bolken et al., Cole et al. and Bayan et al. and art recognized suitability for an intended purpose has been recognized to be motivation to combine. MPEP 2144.07.

10. Claims 41 and 54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bolken et al. (U.S. 2004/0229401 A1) in view of Cole et al. (U.S. 6,705,925 B1) and Bayan et al. (U.S. 6,399,415 B1) as applied to claims 27, 29-31, 33-40, 42-47, 49-51 and 53 above, and further in view of Cho (U.S. 6,235,555 B1).

The combined teachings of Bolken et al., Cole and Bayan et al. substantially teach all aspects of the invention but fail to further teach affixing an outer external package about each of the instances after said singulating. However, Cho (Fig.1) teaches a conventional application of packaged integrated semiconductor circuits, which include affixing an outer casing or package to each of the semiconductor circuits (Cho, column 1, lines 1 – 55). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Bolken et al., Cole et al. and Bayan et al. with Cho to enable affixing the circuit of Bolken et al., Cole et al. and Bayan et al. as taught by Cho to arrive at the claimed invention.

11. Claim 48 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bolken et al. (U.S. 2004/0229401 A1) in view of Cole et al. (U.S. 6,705,925 B1) and Bayan et al. (U.S. 6,399,415 B1) as applied to claims 27, 29-31, 33-40, 42-47, 49-51 and 53 above, and further in view of Islam et al. (U.S. 2004/0058478 A1).

The combined teachings of Bolken et al., Cole et al. and Bayan teach singulating the substrate or leadframe using laser or water jet, but fail to expressly teach singulating said substrate or leadframe using laser and water jet. However, Islam et al. teach a method of singulating semiconductor packages using laser, water jet or a combination of laser and water jet (Islam et al., [0009]). It would have been within the scope of one of ordinary skill in the art to combine the teachings of Bolken et al., Cole et al. and Bayan et al. with Islam et al. to enable the singulating step of Bolken et al., Cole et al. and Bayan et al. to be performed according to the teachings of Islam et al. because one of ordinary skill in the art at the time the invention was made would have been motivated to look to alternative suitable methods of performing the disclosed singulating step of Bolken et al., Cole et al. and Bayan et al. and art recognized suitability for an intended purpose has been recognized to be motivation to combine. MPEP 2144.07.

12. Claim 52 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bolken et al. (U.S. 2004/0229401 A1) in view of Cole et al. (U.S. 6,705,925 B1) and Bayan et al. (U.S. 6,399,415 B1) as applied to claims 27, 29-31, 33-40, 42-47, 49-51 and 53 above, and further in view of Bolken (U.S. 6,444,501 B1).

The combined teachings of Bolken et al., Cole et al. and Bayan et al. substantially teach all aspects of the invention but fail to teach wherein the integrated circuit products are peripheral memory cards. However, Bolken in a method of forming peripheral memory cards (Figs.1 and 5) teaches providing an area (40) on its molding compound with a printed mark for labeling purposes (column 5, lines 31 – 41), and

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wherein the memory card is molded so that its product is a non-rectangular memory card (column 6, lines 41 – 54).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to configure the memory card of Bolken et al., Cole et al. and Bayan et al. as taught by Bolken for the further advantage of identifying the end of the semiconductor card having external contacts and to ensure that a user inserts the card in a proper orientation (column 6, lines 41 – 54).

### ***Response to Arguments***

13. Applicant's arguments with respect to claims 1-18, 20, 21 and 27-57 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

14. Applicants are encouraged, where appropriate, to check Patent Application Information Retrieval (PAIR) (<http://portal.uspto.gov/external/portal/pair>) which provides applicants direct secure access to their own patent application status information, as well as to general patent information publicly available.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to examiner Julio J. Maldonado whose telephone number is (571) 272-1864. The examiner can normally be reached on Monday through Friday.


16. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Smith, can be reached on (571) 272-1907. The fax number for this group is 571-273-8300. Updates can be found at <http://www.uspto.gov/web/info/2800.htm>.

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Patent Examiner  
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October 20, 2005

  
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